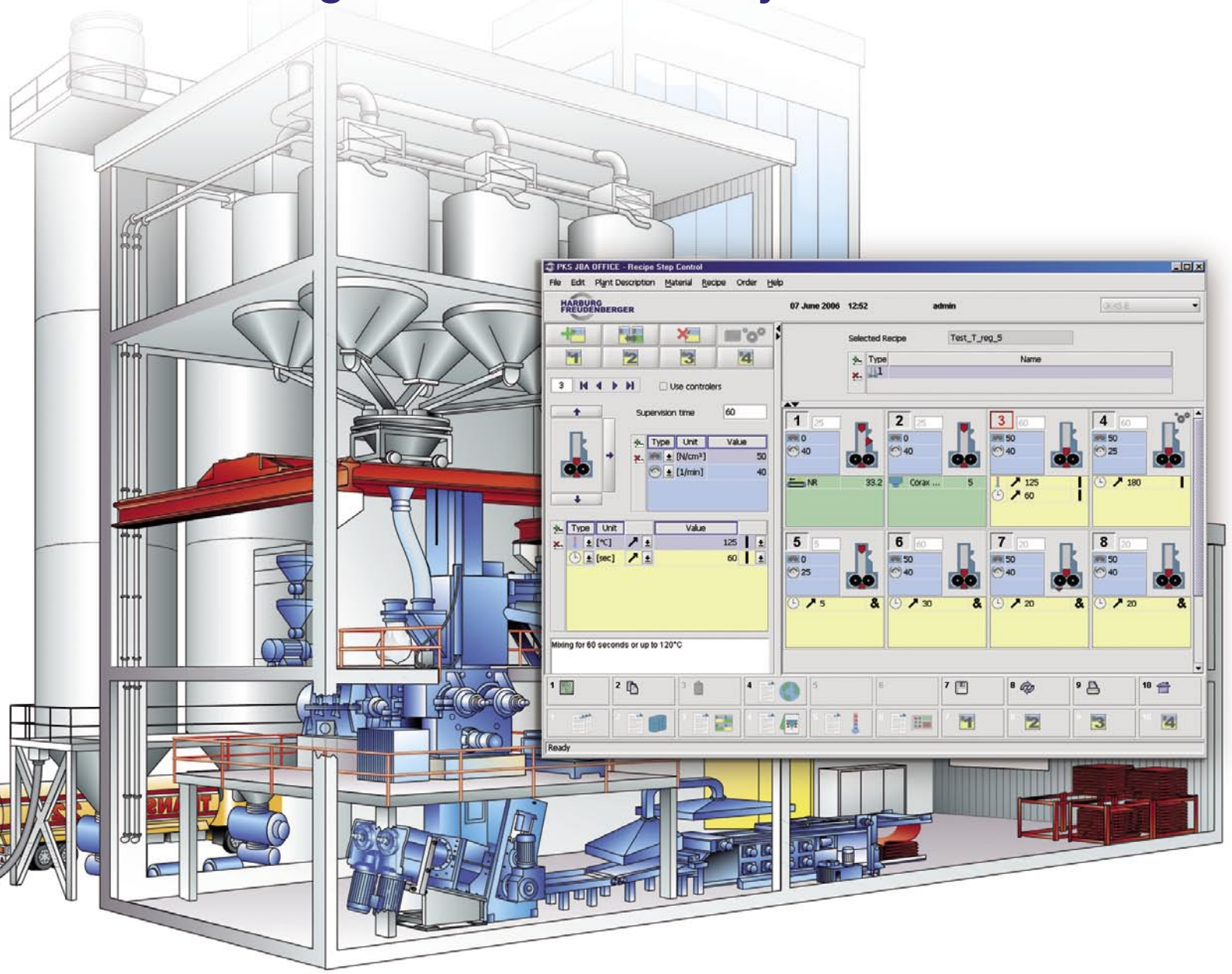
PKS-JBA
The mixing room Automation system

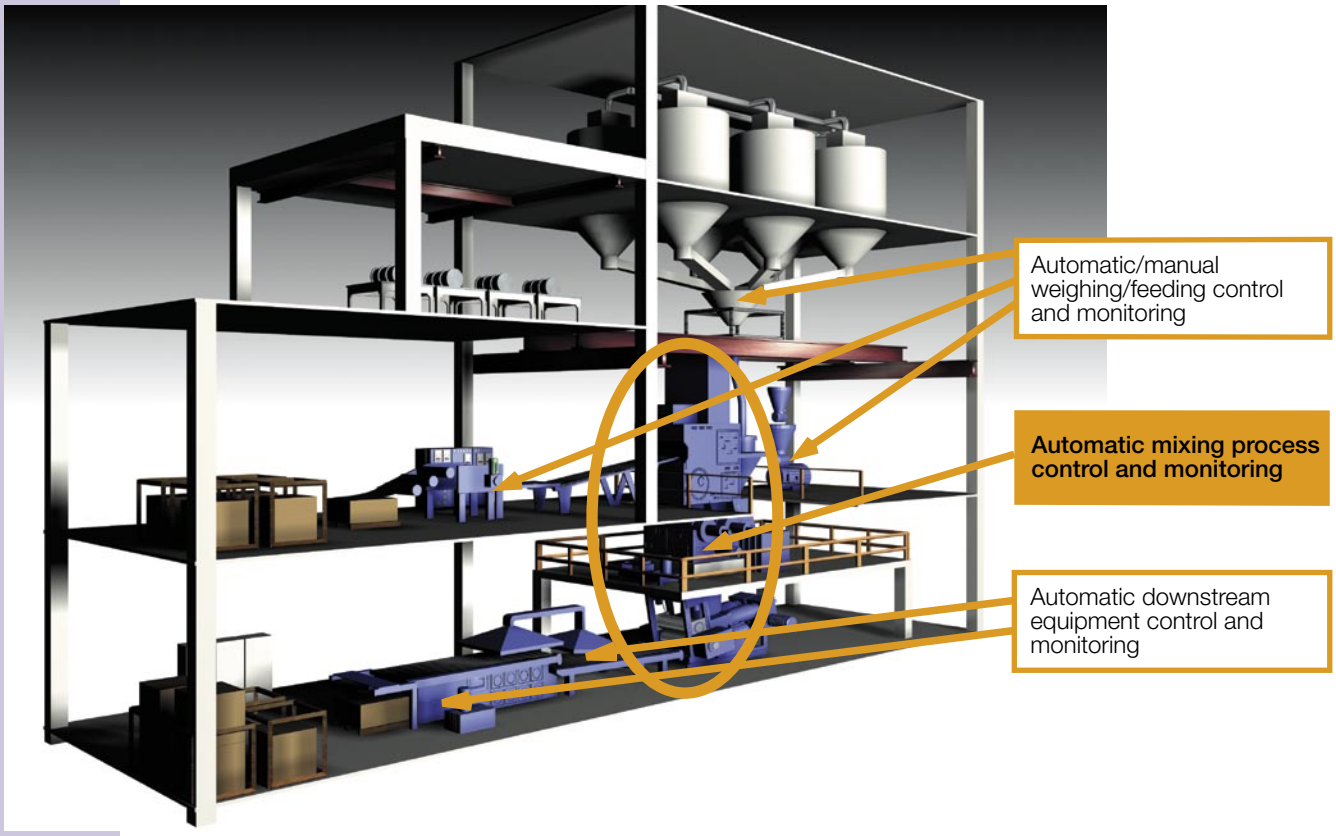


HARBURG FREUDENBERGER

PKS-JBA: Increased productivity, reduced costs, improved quality control

The PKS-JBA automation system is a further development of the PKS 500 system from Harburg-Freudenberger, based on a new platform. JBA stands for Java Based Automation and as the name indicates, the PKS-JBA uses the modern JAVA Internet computer language.

The screen pages have an updated design and the operation is clearly improved. Nevertheless to change from PKS 500 to the new PKS-JBA system is self-explanatory.



PKS-JBA: Integrated mixing room automation

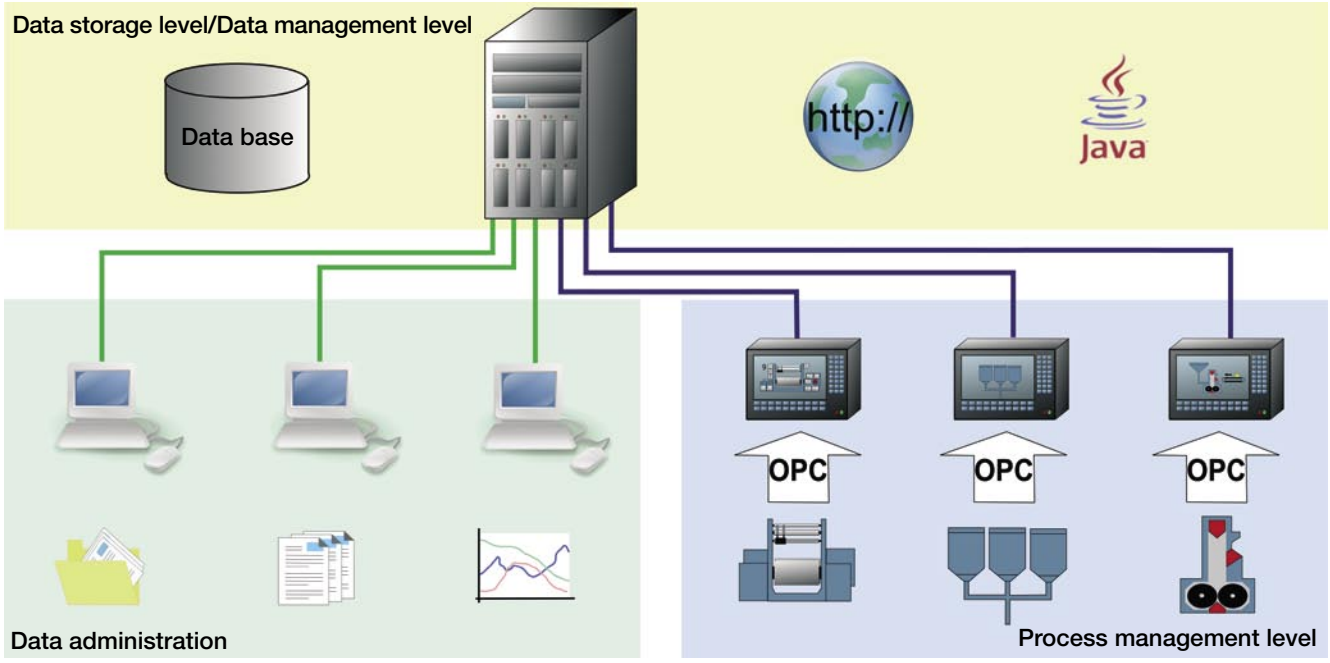
The PKS-JBA was developed with the aim of increasing the productivity of the complete mixing line. As a leading manufacturer of high-performance mixing lines, Harburg-Freudenberger has extensive know-how in machine design, hydraulic systems and mixing process technology. As a consequence this know-how has been incorporated in the development of the PKS-JBA system.

PKS-JBA: Web-based provision of information

The PKS-JBA has a system structure in which the software is installed on a central server. Clients can connect to a Web Browser on the server and download the current software modules they require. Time-consuming work for software installation and updates at the operators' client computers is therefore eliminated.

The PKS-JBA ensures the provision of information:

- Independent of the operator's location
- Independent of the type of computer used
- Not restricted to special work stations
- In real-time with the mixing room processes



PKS-JBA: Real-time process control and monitoring

To ensure the highest accuracy and reproducibility of the mixing, weighing and feeding processes, the PKS-JBA automation system has real-time control. Based on a Soft PLC, all time critical control tasks are completed within a repetition accuracy of less than 10 milliseconds. The architecture also allows the use of intelligent procedural control modules that increase line efficiency and process safety in the mixing room.

The picture above shows a schematic layout of the PKS-JBA automation system, structured in functional levels.

The data storage level contains the central data and program storage facility and the storage of Web based information.

The data administration level contains the client's processes selected for administration, analysis and evaluation of raw material, recipe, process and production data.

The process management level consists of the client's industrial computers, designed for process control, operator guidance and data acquisition.

PKS-JBA: Intelligent control of process engineering

Along with the most modern equipment and mixing room technology, in our Research & Development Centre, we also develop and test all new innovations for the PKS-JBA control system, as for example the previously mentioned process engineering control modules. This ensures the full functionality and operational reliability of the production systems supplied from the outset.

With the acquisition of a PKS-JBA automation system our customers do not only establish a potentially long-lasting partnership with a competent team of electrical engineering technicians and computer scientists, but also with an experienced team of process and mechanical engineers.

The efficient use of an automation system can only be ensured with a combined understanding of the mixing process, the machinery involved and it's controls.

The following high-capacity functional modules are the result of our mixing room know-how:

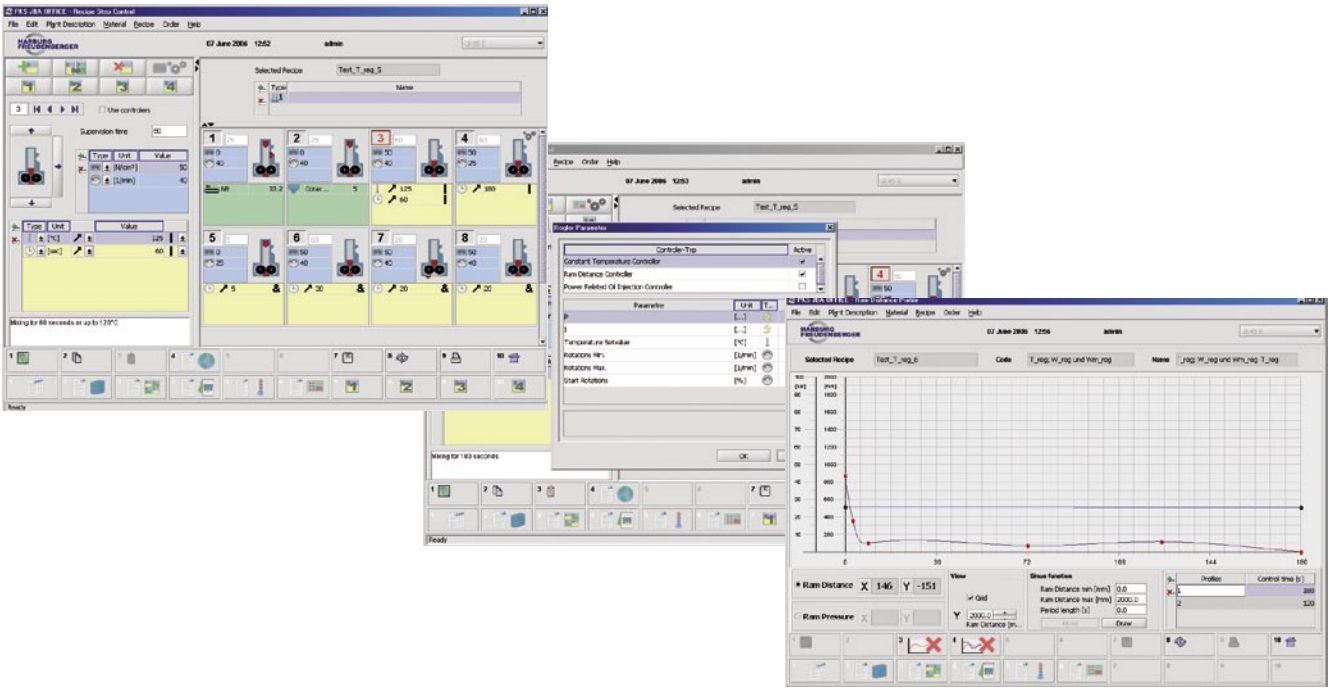
- Step-by-step mixer control
- Weighing and feeding control
- Step-by-step mixing mill control
- Compound temperature control module
- Power regulated plasticizer injection module
- Ram position control module

With the power regulated plasticizer injection module, large quantities of plasticizer can be quickly added into the mixer without slippage in the machine. If incorporation times are acceptable it is possible to add the plasticizer later in the mixing cycle, after carbon black incorporation, to obtain improved dispersion. In addition the use of power regulated plasticizer injection allows the possibility to improve compound cooling in single stage mixing processes. It can also remove the need to use expensive oil extended polymers.

The ram position control allows the creation of a ram position profile as a set value within a mixing step, instead of the standard constant pressure value.

Ram position control is regarded as an important new parameter for process engineering. By using the ram position control, improved distribution can be obtained by the cross flow of material above the rotors and general dispersion is improved by a more varied addition of polymer.

In addition to these process-engineering advantages, the loading on the feed hopper, rotor dust seals and drop door is also reduced.

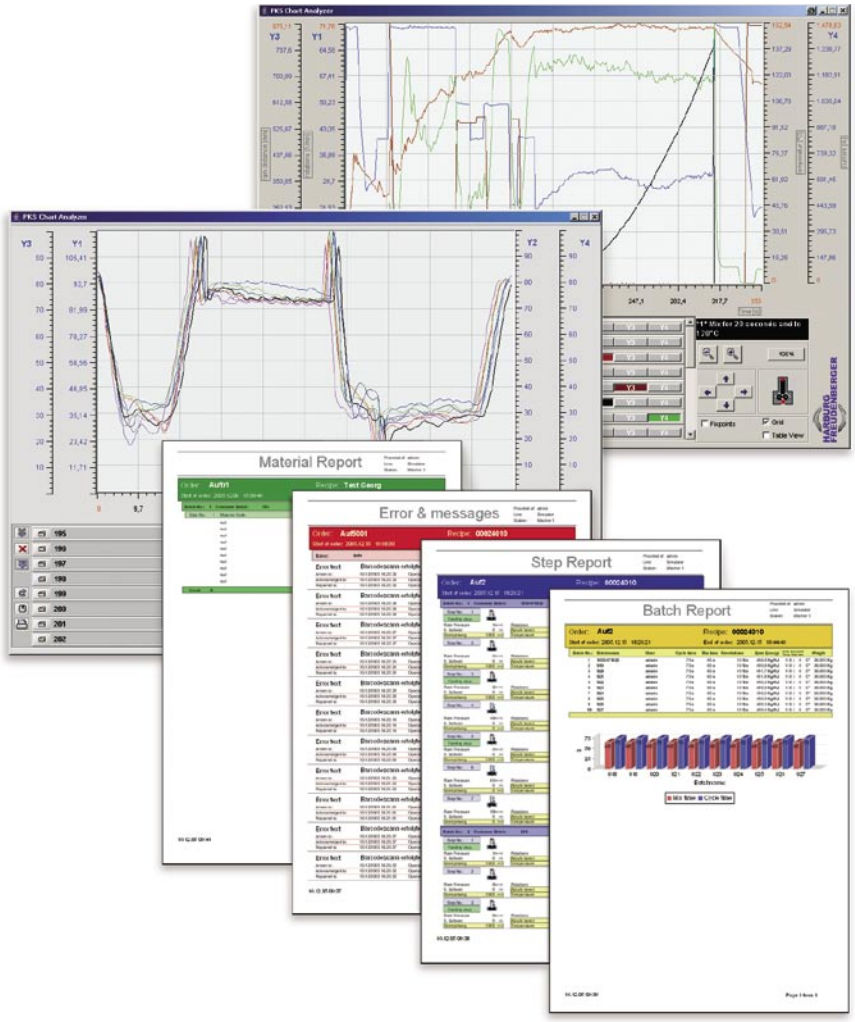


PKS-JBA: Transparency for the process and production

In order to realise the full potential of the mixing room, the mixing process needs to be made transparent. To create this transparency constant data recording of all the relevant process parameters is required.

The PKS-JBA automation system includes a measured data recording system especially tailored for the requirements of the mixing room. For each machine all the available sensor signals and other process data calculated online, can be recorded and stored. The data stored is batch-related, compressed and archived on a central PKS-JBA server. This means that for a period of over one year detailed production information is instantly available for analysis.

The PKS-JBA operator can use the Chart Analyzer for the graphical analysis of the stored process data. This functional module can display several process parameters from one batch, with up to four parameters scaled automatically on the y-axis' to form a chart. It is also possible to display one parameter over several batches. The selected data can be displayed numerically in a table; it can be copied and then be inserted into other programs.



Production data is needed to recognize and evaluate the production processes within their chronology. For this purpose data is acquired process-controlled and are centrally saved with time stamp.

The PKS-JBA functional modules include the process-controlled data acquisition system, structured in production order by, batch, mixing step, material addition, compound discharge and alarms.

The PKS-JBA includes standard protocols for the analysis of this data. The protocols can relate to a production period, specified production orders or selected batches. The protocols are displayed in a print view, but can also be saved in different file formats (PDF, XLS, CSV, etc.).

The traceability of the raw materials used is an absolute essential for the complete documentation of the production processes.

For this purpose the PKS-JBA is equipped with several functional modules based on the use of barcode-systems and/or RF-ID systems. These functional modules such as raw material identification, laboratory release, silo filling, manual weighing, identification of the mixer/mixing mill/dump extruder and the identification of the finished compound can be used as necessary to meet traceability demands.

Harburg-Freudenberger
We develop, build and distribute machines, lines and systems across our three company divisions based on 150 years of company tradition.

Rubber mixing technology
We provide the most comprehensive range of machines for the rubber and caoutchouc industry including all major preparation and processing stages.

- Complete mixing room systems
- Internal mixer
- Mixing mills
- Dump extruder

Caoutchouc technology
Production machines and lines for the manufacture of tires and technical rubbergoods from raw material feeding to vulcanisation:

- Extruder
- Extrusion lines
- Tire building machines
- Curing presses

Edible Oil Technology
Machines for processing oilseed, crude oils of vegetable origin and animal raw materials as well as screw presses for the dewatering of synthetic caoutchouc and similar products:

- Screw presses
- Extraction lines
- Refining lines
- Process engineering

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If you would like to learn more about Harburg-Freudenberger or if you require information on specific services, please do not hesitate to contact us.

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